PRO-ACT
A Base-level Pollution Prevention Resource sponsored by HQ Air Force Center for Environmental Excellence

Success Story

JANUARY 2000

Spotlight On: Grissom Air Reserve Base

Grissom ARB Success Stories

Introduction

Grissom Air Reserve Base (ARB), located approximately 65 miles north of Indianapolis, Indiana, occupies close to 1,200 acres of land, and is home to the 434th Air Refueling Wing (ARW). Grissom ARB was officially opened 1 July 1942 by the U.S. Navy as Bunker Hill Naval Air Station. Following the Korean War, Bunker Hill was closed by the Navy. Bunker Hill Air Force Base was formally opened in June 1954 as a Tactical Air Command (TAC) Base and was home to the 433rd Air Base Squadron and the 323rd Fighter-Bomber Wing. In 1955, the 319th Fighter Interceptor Squadron joined the base along with the Strategic Air Command (SAC), and the 8th Air Force claimed jurisdiction in September 1957. In May 1959, the 305th Bomb Group, with B-47's in tow, arrived followed by KC-135 Stratotankers later that same year.

The base was renamed Grissom Air Force Base on 12 May 1968 after Lieutenant Colonel Virgil I. "Gus" Grissom. Colonel Grissom, one of the original seven astronauts and a native of Mitchell, Indiana, was killed in his Apollo capsule while it was still on the launch pad at Cape Kennedy, Florida. In January 1970, the 305th Air Refueling Wing (ARW) replaced the 305th Bomb Group, making Grissom one of the largest tanker bases in the country. In 1971, the 434th Special Operations Wing along with its A-37 aircraft joined the installation, adding a Reserve unit to the base. In 1978, a second Air Force Reserve unit also joined the base. Due to Air Force mission changes, one reserve and one active duty unit left the installation in 1994, and Grissom AFB transitioned to Grissom ARB.

Today, Grissom ARB is the home of the 434th ARW and is one of only five Air Reserve Command Bases in the United States. The 434th is equipped with 22 KC-135 Stratotankers and is one of the key aerial refueling units in the Air Force Reserve. The 434th ARW consists of three major organizations: the 434th Operations Group, the 434th Logistics Group, and the 434th Support Group.

The land once occupied by Grissom AFB is not all used by the 434th ARW. Approximately 1,345 acres were turned over to the Grissom Redevelopment Authority (GRA) in 1994 when the active-duty portion of the base was closed. The GRA is a community-based council created in an effort to preserve the land, buildings, and jobs that may have been lost when the base was closed. Known as Grissom Aeroplex, the former base now consists of the 434th ARW, a Cost Plus World Market distribution center, Franklin Power Products, and Marburger Foods. Additionally, Aspen Square Management purchased the 1,100 homes that were previously base housing. Following renovation, the homes will be put up for sale or lease. A State correctional facility was built on a corner of the property and was opened in the fall of 1999, creating an additional 500 jobs for personnel in the local community. The idea is to create a town out of what was once known as Grissom AFB, and to provide jobs and housing enabling the local community the opportunity to continue to flourish.

Grissom ARB's Commitment to Excellence

Grissom ARB has proven itself to be committed to the preservation of the environment. Their efforts in environmental quality, especially in the areas of pollution prevention and recycling, have not gone unnoticed. To date, Grissom ARB has received seven Air Force installation-level awards, along with numerous individual awards received by Civil Engineering's Environmental Flight personnel led by Mr. Jeff Woodring. In addition, the Grissom Recycling Service (GRS), operated by the Environmental Flight, was recently the proud recipient of the *1999 Indiana Department of Environmental Management Governor's Award for Excellence in Recycling*. Their efforts, including the return or reuse of scrap metal and wood debris, and the recycling of cardboard, paper, plastic, aluminum cans, specialty metals, and office recyclables, just to mention a few, have resulted in an overall 50.22% solid waste diversion rate. In 1998, GRS received one of the Air Force's highest environmental honors, the *General Thomas D. White (GTDW) Awards for Environmental Quality (Reserve Component).* The GTDW Awards recognize installations conducting the Air Force's best environmental programs. Grissom's award focused on their achievements in areas such as recycling, minimum hazardous waste generation, secondary containment installation, and clean-up of contaminated sites. The 1998 award citation remarked that the pollution prevention program at Grissom resulted in a 79% reduction in hazardous waste, an 80% reduction in solid waste and a 79% reduction in Environmental Protection Agency (EPA) priority pollutant purchases. Grissom also received the GTDW award in 1997 in the Environmental Quality category. Grissom ARB individuals work extremely hard to achieve excellence in recycling and all other areas of their environmental programs. They are dedicated to the protection of the environment and the health of the individuals working in it.

Leadership in Recycling

Grissom Recycling Service (GRS) collects thirty-seven different types of recyclable items from various Department of Defense (DoD) agencies, non-profit agencies, and selected businesses on the Grissom Aeroplex. Operated by the Environmental Flight, 434th Civil Engineer Squadron, the Grissom Recycling Service supports over 1,500 people working in 45 facilities throughout the Aeroplex and was established on 1 October 1994 as a DoD Qualified Recycling Program (QRP).

During 1997 and 1998, GRS handled over 150,000 pounds of recyclable cardboard, paper, plastic, aluminum cans, specialty metals, and other office recyclables. The program also managed the recycling of 240,000 pounds of scrap metal. The total amount of recurring, non-hazardous, solid waste recycled by the program increased 26 percent from 1997 to 1998 (from 328,000 pounds to 413,000 pounds). Over 85 percent of this increase came from an aggressive program to have base construction contractors return recyclable materials to GRS. A majority of material collected from contractors was scrap metal that previously had been disposed of as solid waste.

This 26 percent increase does not include non-recurring materials recycled by the program such as 9,355 tons of ground asphalt from a taxiway construction project and 300 tons of construction and demolition debris, all of which was reused on the installation for gravel roads, clean fill, and soil repair. Grissom currently has one of the highest combined (i.e. hazardous and non-hazardous) solid waste diversion rates in the Air Force Reserve at 50.22%. This achievement is particularly outstanding since the current DoD goal is to achieve a 40% diversion rate by 2005!

Recyclables about to be processed through the Grissom Recycling Facility

Grissom ARB Recyclables

Alkaline Batteries
Aluminum Cans
Antifreeze
Asphalt
Bubble Wrap
Cardboard
Cleaning Solvents
Color/Mixed Paper
Compact Discs
Concrete/Brick
De-Icing Fluid
Fluorescent Light Tubes
Food Glass (clean)
Freon
HDPE Plastic (#2)
Industrial Rags
Ink Jet Cartridges
Lead-Acid Batteries
Light Ballasts
Mercury-Containing Items
Mixed Metals (Scrap/Cans)
Newspaper
NiCad Batteries
Oil Filters
Packing Peanuts
PETE Plastic (#1)
Petroleum, Oils, Lubricants
(POL such as Motor Oil, JP-8, etc.)
Plastic Blast Media
Pulverized Paper
Shredded Paper
Specialized Metals
(Aluminum, Copper, Brass)
Steel Drums
Tires
Toner Cartridges
White Paper
Wood Pallets
Wood Scrap (Mulch)
Yard Waste

A Team Effort

As part of the Grissom Recycling Service, the installation operates seven base-wide specialty-recycling programs that are completely managed and/or operated by Air Force personnel. These programs include initiatives such as:

- Operation of two vehicle and building antifreeze reclaimer machines that recycle up to 600 gallons of antifreeze per year;
- Collection and processing of 1,480 pounds of fluorescent light tubes;
- Collection of used oil, oil filters, and fuel filters for reclamation;
- Annual recycling of 19,800 pounds of cleaning solvents;
- Collection and accumulation of over 1,800 compact discs for shipment to independent recyclers;
- Annual collection and packaging of 800 pounds of laser toner cartridges that are remanufactured by the Federal Prison Industries and other companies; and
- Collection of 2,225 pounds of alkaline batteries for recycling as part of the State of Indiana battery collection program.

Leadership's Commitment to Recycling…A Success!

The leadership within organizations across Grissom has combined to provide labor, equipment, and facilities to enhance recycling efforts on the base. Base leadership recently supported the enlarging of GRS floor space by 40 percent to allow room for more diverse separation of materials by type and class, thereby increasing the market value of the recycled material. The installation has also replaced the old collection truck used by the service with a newer, more reliable vehicle allowing for improved response time to customers and greater collection flexibility. Finally, Headquarters Air Force Reserve Command recognized the excellence of the GRS' effective, far-reaching program, by supporting a $460,000 expansion and renovation of the recycling facility and construction of a recycling storage yard.

Direct Benefits to the Environment

GRS collocates all non - hazardous scrap wood, wood demolition debris, and landscaping/storm debris at a single collection point. It is then ground into landscaping mulch for Grissom's beautification and soil erosion control programs. In 1999 alone, Grissom produced over 60 tons of mulch through this program.

Grissom's Recycable Wood Collection Point

An Innovative Approach

GRS distributes questionnaires on an annual basis to all users of the recycling service. The service has used this customer feedback to develop, coordinate, and schedule a revised collection process guaranteeing all recyclable materials are picked up with "one-stop" ease. Gary Belconis, GRS Program Manager, noticed that fluorescent tubes, lead-acid batteries, and nickel-cadmium batteries required separate, labor intensive paths to reach Grissom's Hazardous Waste Storage Facility to await shipment to recyclers. He worked with generators, facility managers, and the storage facility manager to streamline the multiple tasks into a single, integrated process. The new process involves a coordinated system of regular, combined pick-ups of these items and consolidated delivery into the Hazardous Waste Storage Facility. This consolidation resulted in a drastic reduction in time spent by skilled Air Force Reserve technicians who were previously collecting and transporting the recyclable items, consequently allowing them additional time to focus on their core national defense mission.

Out-of-the-Box Thinking Produces Results

During the transitions on the Grissom Aeroplex, GRS noticed that more and more customers were asking for "moving boxes" to support office relocations. In response to these requests, GRS developed a "Moving" program to coordinate base moving schedules amongst customer contacts. The service arranged to pick up used boxes after one move and transport them directly to the next office preparing to move, thereby avoiding double or triple handling of the boxes. With this special moving program, GRS was able to provide over 300 moving boxes to offices preparing to relocate, saving over $1,000 in new box costs. Some of the boxes were reused up to five times!

Savings Were More than Peanuts

A new packing material reuse program was launched by GRS that involves gathering packing peanuts and bubble wrap throughout base and delivering it to Grissom's Outbound Shipments shop or stockpiling it for general base use. The program immediately saved $275 in new material and disposal costs, and continues to save on the purchase of packing materials, while successfully keeping high volume, low-density material out of landfills.

Smart Recycling

GRS develops and maintains a close working relationship with its customers, enabling them to institute new recycling program initiatives with relative ease. The service has established a program of special facility educational and awareness visits where informational materials and promotional items, designed to encourage participation in recycling and increase the quality of materials turned-in for recycling, are distributed to its customers. By regularly "checking the pulse" of their customers, GRS has a constant flow of inputs to use in fine tuning their recycling operations such as changing material consolidation points, adjusting the frequency of regular pickups, and responding to special requests to meet changing circumstances. During GRS surveys, facility managers are asked questions such as:

- What materials are recycled in your building?
- What materials do you not now recycle that you may be able to recycle?

- What is your biggest recycling headache?
- How do you rate the service?
- How can we improve our service to you, your building, or the base?
- Do you need more/different recycling bins?

America Recycles Day

In an effort to encourage base personnel to increase their recycling efforts and purchase recycled products, GRS established a program leading up to their participation in America Recycles Day (ARD) on 15 November 1999. Between 15 September and 15 November 1999, base participants were asked to fill out pledge cards and make a personal commitment to either buy more recycled-content products, increase their recycling efforts at home and work, or make another recycling pledge of their choice.

As part of the ARD program, Grissom Recycling Service put together an all-day education and training program. The program consisted of an extensive recycling display that included demonstrations such as:

- An explanation of Grissom Recycling Service initiatives and results;
- Examples of 32 of the 37 items recycled on base;
- A showcase of undesirable contaminants occasionally turned-in with recyclables; and
- Samples of two dozen products made with recyclable materials.

This recycling display was so popular and well received, it became a traveling exhibit and was displayed in four high-use facilities over the next three months. It was also displayed to the public at the Grissom Open House.

GRS further enhanced the program by asking participants to turn in used eyeglasses or greeting cards with their entry forms. Participants making a pledge were entered into installation, State, and national drawings for prizes, with the grand prize being an American Green Dream House, a home constructed of recycled-content and energy efficient materials, to be built anywhere in the continental United States. (Details on the national program may be found at the WWW site **http://www.americarecyclesday.org/.)**

World Class Dumpster Diving

Solid waste audits, also known as "Dumpster Dives," are a key component of GRS' education efforts. Base personnel are surprised by the waste that "goes out the door with the trash," and these solid waste audits have been successfully used as an "eye-opening" tool for the customers. The "dumpster dive" process involves entire dumpster loads being separated, classified, weighed, and photographed. Next, the entire facility's occupants are briefed on any recyclable material that is found within the dumpster. As a result of the new awareness imparted through the training, one organization on Grissom reduced the percentage of recyclables found in its trash from over 50 percent down to 20 percent within 6 months. Throughout the installation, word has spread about the dumpster dives, and many units have taken the proactive approach of policing their own dumpsters. Consequently, the amount of recyclables in the solid waste stream has been reduced by 10 percent base-wide.

Since recycling awareness has become more prevalent across the base, the Environmental Flight is able to hand out friendly Recycling Discrepancy Notices, rather than performing "Dumpster Dives," whenever recyclables are spotted in a facility's waste container. The educational, brightly colored "tickets," are issued and then reviewed with the facility's manager to improve occupant awareness of recycling opportunities.

Positive Reinforcement

An awards program has been initiated to recognize individuals, shops, and organizations for excellence in recycling. GRS provides awards to superior performers, sustained quality, innovation, and significant improvement. The service presents the awards semiannually in conjunction with Earth Day and America Recycles Day. Throughout the year, the service makes periodic presentations of gifts made from recycled materials to recycling survey respondents and recycling quiz perfect scorers.

Battery Recycling

Mr. Tom Parkins, Hazardous Materials (HAZMAT) Pharmacy Manager, has been very resourceful in promoting battery recycling at Grissom ARB. Using a company called INMETCO that is headquartered in Ellwood City, Pennsylvania, Mr. Parkins is able to collect and recycle nickel cadmium, alkaline, nickel metal hydride, lithium ion, and sealed lead acid batteries. The program offered by INMETCO offers

users the purchase of a prepaid container that has the capacity to hold up to 30 pounds of batteries, and includes the cost of the container shipment (via UPS) back to INMETCO along with the recycling of the batteries. Shipment is included from anywhere in the U.S. including Hawaii and Alaska. Containers can be ordered individually or in groups, and are specifically designed for the different types of batteries. (Customers cannot mix different types of batteries together in one container.) The program is easy to run, and has proven to be beneficial for the customers at Grissom, as well as a great pollution prevention initiative.

Affirmative Procurement

Grissom ARB has successfully implemented an affirmative procurement program (APP) that is in full compliance with Executive Order (EO) 13101 *"Greening the Government through Waste Prevention, Recycling, and Federal Acquisition,"* 14 September 1998. EO 13101 directs government agencies to purchase items made with recovered material, bio-based products, or environmentally preferable products. Grissom's program tracks 36 types of products including paper, concrete, carpet, toner cartridges, binders, and plastic trash bags to ensure that purchases of these products contain at least a specified minimum percent content of recycled materials. Additionally, all installation organizations are required to purchase products that are composed of recovered and bio-based materials, to the maximum extent practicable, and that are consistent with EPA guidelines. Grissom has developed program policy that assigns specific responsibilities regarding affirmative procurement to critical stakeholder organizations on the installation including the Environmental Management Flight, Contracting, Supply, Transportation, and the Base Civil Engineer. The Grissom APP also includes a promotion program designed to educate employees, contractors, and potential contract bidders on the possibilities and procedures for affirmative procurement initiatives. Finally, Grissom has established clear procedures for monitoring and annually reviewing the effectiveness of the APP by tracking purchases and maintaining records of products containing recycled content.

Storm Water

Grissom has designed an aggressive campaign to protect water quality at the installation through the implementation of several Best Management Practices (BMPs). The BMPs that are successfully in use at Grissom include:

- Development and implementation of a Storm Water Pollution Prevention Plan (SWPPP);
- Placing aircraft in hangars prior to winter storm events to reduce or eliminate the need for deicing;
- Educating personnel on the proper use of deicing equipment and operating procedures in accordance with technical order (T.O.) 42C-1-2;
- Ensuring all deicing equipment is properly calibrated to enable maximum effectiveness with minimum chemical usage; and
- Successful procurement and operation of equipment that incorporates the use of potassium acetate rather than urea during pavement or airfield deicing.

Deicing/Anti-Icing

Aircraft Deicing/Anti-Icing

Grissom recently completed construction of a $750,000 containment and collection system for aircraft deicing. Grissom had already incorporated deicing/anti-icing pollution prevention BMPs such as storing aircraft in hangars the night before a freeze and scheduling flights later in the day; however, they were still concerned with the environmental impact of stormwater runoff contaminated with deicing chemicals. The new deicing pads are a good way to minimize contact between potential pollutants and stormwater runoff and to reduce discharge of the chemicals such as propylene glycol to the environment altogether. As many as 70 aircraft per year require deicing, and use approximately 4,000 gallons of a 50/50 mixture of propylene glycol and water. Deicing agents typically require a high biochemical oxygen demand (BOD) for degradation purposes and can be toxic to aquatic organisms or can cause groundwater degradation from stormwater runoff. The new deicing pads, which consist of a primary and secondary pad, allow two aircraft to be deiced at the same time. After application to the aircraft, the deicing agent runs into drainage tunnels, through two lift tanks, and finally to a storage tank where it is tested for content. So far, the solution has been diluted enough (less than 20% glycol) to allow for its controlled release to the sanitary sewer, thus eliminating the need for hazardous waste disposal. Grissom has attempted to recycle the deicing agent, but due to the 50/50 water and glycol combination and the addition of snow and ice, the mixture has been too diluted to recycle. The primary deicing pad is large enough to contain a KC-135 aircraft, and has proven to be quite effective. Drainage ditches along the deicing

pad that previously had been without aquatic life are now healthy and abundant.

The Grissom ARB Aircraft Deicing System

Mobile Airfield Deicing Shop Equipment

In an additional effort to limit impact to the environment, a new liquid chemical deicer applicator was purchased. The 1,600-gallon, truck-mounted runway deicer uses a 50/50 mixture of potassium acetate and water, and releases the agent at a rate of 90 gallons per minute at 50 pounds per square inch (psi). The deicing tank is connected to a computerized nozzle set with a 45-foot spread to effectively cover the runway and taxiways. A synopsis written in an A-Gram sent out by Headquarters Air Force Civil Engineer Support Agency (HQ AFCESA) stated that this is not a vehicle, but shop equipment, and has a price of approximately $90,000. It has been a wonderful tool, and the potassium acetate has proven to be equally sufficient as a deicing agent and better for the environment.

Mobile Airfield Deicing Equipment

Critical Survey of the Sanitary Sewer

Ms. Cathy Collins of the Environmental Flight recently led a comprehensive assessment of the sanitary sewer system at Grissom using the Air Education and Training Command (AETC) Environmental Reveal Unit (point of contact Mr. Don L. Davis, DSN 473-2203). During the survey, sanitary sewer lines were cleaned and televised throughout the installation. Areas of root intrusion, calcium buildup, debris, infiltration, exfiltration, and offset joints were identified and video taped. This extensive survey enabled Grissom to identify areas where critical repairs were needed, aided in the prevention of ground water infiltration, and reduced the volume of sanitary sewage generated by the installation.

Painting Operations

Virtually every base with a paint shop and an operating paint booth experiences difficulty with it and Grissom ARB is no exception. Recently, SMSgt Gary Flook, Structural Maintenance Supervisor of the 434th Maintenance Squadron, observed that the paint booth was not working properly because dust was getting into the booth (causing a bad finish) and the temperature was constantly unstable. Mr. Scott Weaver of the US Army Corps of Engineers and Ms. Lisa Marx of the Environmental Flight studied the paint booth construction drawings and identified several factors that were causing the booth to operate inefficiently. They determined that the booth did not need to be replaced, as was originally believed, but that a few areas did need to be corrected. The paint booth had been constructed within a building already containing administrative offices rather than being designed as an integral part of the building's function. When installed, the paint booth was isolated from the administrative offices by a roll-up door, but the booth itself was not isolated from the room it is in. Two problems have been observed with this arrangement:

- Insufficient make-up air replaces air blown out of the booth; and
- Make-up air is pulled down from the duct on top of the booth, across the dirty exterior surfaces of the booth, and finally through the booth and into the filters. This results in make-up air that is full of dust, both from on top of the booth and from underneath the roll-up door.

In an effort to correct these problems, the amount of make-up air leaving the paint booth will be adjusted down, while the amount coming in will be adjusted up, and filter doors are being placed in front of the booth to eliminate dust getting onto parts being painted.

In an effort to refine the painting process, additional lighting is being installed in the paint booth. Currently, there are only overhead lights, which tend to create shadows on the product being finished. Panels on each side of the booth are going to be replaced with lights, so that the best product can be completed on the first coat. The overall effect of these improvements is a reduction in the amount of paint used, emissions generated, and time required to complete the task.

Paint Guns, Sempens, and Gun Cleaners

Personnel in the Structural Maintenance/Paint Shop have switched from conventional paint guns to new electrostatic HVLP guns made by Graco. So far, this change has resulted in a 35-40% reduction in paint usage. They have also found success with the Air Verter touch-up gun (NSN 4940-01-391-6313), which enables them to quickly fix small spots without wasting paint. A paint log is also kept on a daily basis to track paint usage, and is sent to the Environmental Flight on a monthly basis to facilitate air emissions and toxic release inventory (TRI) tracking. Paint Shop personnel are taking every possible step to ensure equipment is properly used, minimum paint quantities are used, and new environmentally friendly measures are implemented when possible.

The Paint Shop recently purchased the environmentally friendly Ecolink gun cleaner. The gun cleaner has two basins: one containing isopropyl alcohol and another containing a non-hazardous product called Safestrip. The cleaner has been highly effective, both in cleaning the guns for their next use, and in eliminating the need for Methyl Ethyl Ketone (MEK), an EPA-17 priority pollutant chemical. The isopropyl alcohol is also used as a substitute for MEK in surface preparation and parts cleaning operations.

Finally, Paint Shop personnel at Grissom ARB have had success with the Sempen touch-up paint markers. They are currently using Courtaulds Aerospace markers with NSNs 8010-01-441-5875, a gloss; 8010-01-441-5877, a flat gray paint; and 8010-01-441-5878, a gray primer. These pens have aided in achieving the shop's paint reduction goals, and are very effective.

New Gas Heat System

Make-up air coming into the Structural Maintenance paint booth is currently preheated by a steam system. The problem with this system is that when the temperature falls below freezing, the steam system shuts down. When this occurs, the solvent in the paint does not evaporate at a proper rate, resulting in peeling or running paint. Workers must either not work at these temperatures or rework everything done in freezing temperatures. This problem is being corrected by the installation of a gas heat system. This system will allow the pipes to supply make-up air at a constant temperature all year round, and will save workers hours of time and effort.

Audio Indicators

One other addition to the paint booth room will be a new system to detect a drop in pressure across the paint filters. A manometer, located on a wall near the paint booth, provides a visual indication of pressure in the booth; however, sometimes workers focusing on their painting operations do not notice pressure changes reported on the manometer. In an effort to ensure filters are changed at proper intervals, an audio indicator is being installed. The indicator will sound an alarm and flash lights when the pressure drop across the filters is too great, indicating the filters need to be changed.

Refined Painting

The Grissom Paint Shop desired to improve their painting techniques in order to reduce paint usage and rework. They requested information on a “Train-the-Trainer” Program offered by Ron Joseph & Associates, Inc., San Jose, California, (408) 446-9736. The program consists of a four-day class and is centered around four goals:

- Teaching painters how to improve performance (via improved transfer efficiency) to achieve immediate results in reducing emissions of Volatile Organic Compounds (VOCs), Hazardous Air Pollutants (HAPs), the generation and disposal of hazardous waste, and the disposal of contaminated water from water-wash spray booths;

- Providing painters with instruction enabling them to complete the job correctly the first time, eliminating the task of rework or possible rejected projects;

- Instructing supervisors and on-site trainers who will be able to continue the monitoring or training process after the program is completed.

- Familiarizing painters and supervisors with their responsibilities regarding implementation of paint and coating regulations, as well as permit conditions.

The class is an excellent example of the extensive measures Grissom is willing to take to improve efficiency and environmental friendliness.

Grissom's Painters Receiving Training

Vinyl Printing Replaces Paint Use

Grissom's Structural Maintenance Shop took the initiative to reduce paint usage by replacing stenciling operations and other sign making needs with a vinyl printing system that utilizes a custom designed computerized signmaking system. With the Gerber Graphix Advantage thermal transfer printer and cutting plotter, Structural Maintenance personnel are able to create any kind of stencil, including items such as aircraft tail numbers and decals for aircraft or Aerospace Ground Equipment (AGE) using this special vinyl design. Occasionally, a vinyl design is used in conjunction with the small touch-up gun to create customized aircraft identification marks, eliminating a need for large quantities of paint and a more detailed high-quality product. The Structural Maintenance Shop has truly searched for the most effective, environmentally conscious purchases to improve their processes. Additional information on the stencil equipment used by Grissom may be obtained at the World Wide Web (WWW) page at **http://www.gerbervm.com/index.html**.

Pesticide Management

The Grissom ARB's Pest Management shop has made tremendous strides in minimizing and, in many cases, eliminating the use of toxic chemicals. Mr. Don McKinley (DSN 928-4785), Chief of Pest Management, has conducted an aggressive and systematic campaign to fine tune pesticide and herbicide chemical selection and application techniques to maximize toxic chemical reduction efforts in all aspects of his shop's operations. Some of the key initiatives the Pest Management shop is implementing include:

- Use of insect growth regulator chemicals to slow insect reproduction rates, thereby reducing the frequency of necessary pesticide applications;

- Application of liquid dish detergent and water near building slab cracks and seams to deter ant trails;

- Use of bacterial briquettes to reduce bird-attracting mosquito populations in the vicinity of the flight line;

- Purchase of a WeedSeeker DB210 herbicide applicator. The system includes a John Deere Gator™ cart, ten chlorophyll sensors mounted on a rigid boom, a controller, chemical and fresh water tanks, and all associated plumbing. The sensors on the cart-mounted spray booms detect when they are traveling over vegetation. When the sensors detect the presence of a plant below the sprayer, herbicide is applied. Conversely, when plant growth is not detected below the sprayer, herbicide is not applied. The system works during both day and night applications and has been recommended for Air Force use by the Air Force Management and Equipment Evaluation Program (MEEP). The base estimates that the $21,000 system will reduce its herbicide usage by 50-80%.

- Application of Regixit™ bird repellant, a grape-juice based substance, in bird air strike hazard (BASH) potential areas; and

- Scheduling of pesticide and herbicide application times to maximize effectiveness and minimize required application volumes.

Mr. Don McKinley's dedicated efforts have resulted in a reduction from 180 pounds of pesticide usage in 1997 to only approximately 128 pounds usage in 1998.

Installation Restoration Program (IRP)

Grissom ARB has achieved tremendous amounts of success with their Installation Restoration Program (IRP). Since active duty as well as two reserve flying units operated at Grissom, two fuel pump houses and an associated hydrant fuel system were essential for fueling operations. At the beginning of Fiscal Year (FY) 1999, a project was undertaken to remove a no longer needed hydrant system and one of the pump houses. This excavation resulted in the removal of eight 50,000-gallon underground storage tanks (USTs). Through aggressive management of all removed materials, Grissom was able to recycle all of the wiring, piping, and tank parts under the base Metal Recycling Contract; approximately 75.5 tons of scrap steel! The residual fuel and rinse water pumped out of the tanks was recycled, resulting in approximately 14.5 tons (or 3,498 gallons) of oil being reclaimed. An associated transformer pad was also broken up and the concrete debris were reused. The soil excavated from the site was segregated into three areas: clean, questionable, and contaminated. The clean soil was reused as fill; the questionable soil was tested and, where possible, reused as fill; while the contaminated soil was disposed of off site. Altogether, over 2,770 tons of soil was reused as fill.

An underground storage tank being removed from an IRP site

Soil Recycling

Ms. Lisa Marx, an Environmental Engineer in the Environmental Flight, has been very resourceful in finding new ways to improve the efficiency and environmental "friendliness" of excavation projects. She was able to identify a Soil Recycling Facility that takes contaminated soil, aerates it, and, once clean, sells the recycled soil as fill. Provisions to ensure the recycling of excavated soil, where possible, are now being written into base restoration contracts. Only as a last resort can base restoration contractors use a landfill. Grissom's soil recycling efforts have been presented at the base Restoration Advisory Board so the local government, industry, and community members will recognize Grissom ARB's efforts to protect the environment and hopefully become active partners in future recycling endeavors. Because of the success of its underground storage tank (UST) excavations, Grissom ARB has an excellent model Statement of Work (SOW) for these types of projects. The Grissom ARB-developed methods of soil recycling and reuse save landfill space, landfill fees, and transportation costs for the disposal of restoration generated debris.

Alternative Fuel Vehicles

The use of Alternative Fuel Vehicles (AFVs) reduces emissions of air pollutants such as volatile organic compounds (VOCs) which can lead to formation of ground level ozone. Whereas the Clean Air Act Amendments (CAAA) of 1990 specified AFV acquisition requirements, the Energy Policy Act of 1992 (EPACT) started to pave the way for establishing National goals for energy efficiency and fossil fuel use reduction and included legislation for vehicle fleets to begin to use alternative fuels. In addition, Executive Order (EO) 13031, *Federal Alternative Fueled Vehicle Leadership*, 13 December 1996, states that "to the extent practicable, agencies shall use alternative fuels in all vehicles capable of using them." An alternative means for meeting AFV mandates is to convert existing vehicles to a compressed natural gas bi-fuel configuration. Grissom has made great strides in the effort to reduce fossil fuel emissions by converting 18 of its vehicles to dual-fuel (or bi-fuel) capacity. The vehicles all have the capability of switching between gasoline and compressed natural gas (CNG). The CNG contains almost no nitrogen or sulfur and does not mix with oil during use. It may help reduce the deterioration of emissions control devices that are common to gasoline-only powered

vehicles, so it may prove to be very effective in the prevention of ozone pollution. Grissom has also installed a CNG refilling station consisting of a series of 18 highly pressurized tanks. The vehicles can be refilled via the '"fast" method, which requires just under 5 minutes, and has sufficient capacity to allow the vehicles to operate on alternative fuel 100% of the time. Performance of the converted vehicles remains the same, but the range (or mileage between fill-ups) can be about 50% less than that of a normal gasoline powered vehicle. Most types of vehicles converted to the dual-fuel version were small vehicles such as cars, trucks, and vans. Also, none of the converted vehicles are diesel-powered.

Grissom's CNG Fuel Facility

Asbestos

Grissom ARB has successfully conducted a very aggressive campaign to protect base occupants against exposure to friable asbestos. To combat this issue, Grissom formed a "Tiger Team" composed of representatives from Bioenvironmental Engineering, Safety, Environmental Management, and the base labor union. The team conducted a survey of mechanical rooms and workspaces across the base to evaluate any asbestos exposure risks that were present. Areas with exposure risks that were deemed unacceptable received immediate asbestos abatement. To ensure that all areas where asbestos was removed were restored to full operating condition as efficiently as possible, the base required the asbestos abatement contractor to immediately replace any asbestos insulation removed with non-asbestos insulation.

Partnerships

Grissom ARB has made extra efforts to share its environmental management leadership with the local community. Recognizing that Grissom ARB's environmental management efforts can be enhanced through alliances with federal, State, and local government and industry, the base has taken a leadership role in several environmental partnership initiatives.

Partnership with the State of Indiana Prison System

Grissom ARB is finalizing a Pollution Prevention Partnership with the State prison located adjacent to the installation. Grissom will supply the prison with waste paper that has been pulverized to protect classified information. Previously, the Grissom Recycling Service had difficulty in marketing the pulverized waste paper due to the small particle size, which makes handling and bailing by recycling companies difficult. Prison laborers will mix the pulverized paper with food waste and other organic materials in a composting operation. The resulting finished compost material will be used throughout the military/civilian Grissom Aeroplex.

Department of Defense (DoD) Pollution Prevention Partnership

Grissom Air Reserve Base has taken a leadership role in establishing a DoD/State of Indiana Pollution Prevention Partnership. Mr. Gary Belconis of the Grissom Environmental Flight initiated contact with federal, DoD, and State agencies throughout Indiana to establish the partnership. These agencies include the US Environmental Protection Agency (Region 5), the Indiana Department of Environmental Management, the Indiana Air and Army National Guard, and the Air Force, Army, Navy, and Coast Guard. The partnership was established to enhance and promote environmental stewardship by forming a proactive, results-driven pollution prevention team. The mission of the partnership is to create a working relationship with government agencies and local communities to promote and implement pollution prevention as the preferred strategy for protecting the environment; conserving resources; fostering community well-being; achieving State and federal environmental priorities; and enhancing mission readiness. Guiding principles for the partnership include utilizing consensus-based decision-making and demonstrating a commitment to partnership participation. The point of contact for the partnership is Hugh M. McAlear, Region 5 Area, Army Regional Environmental Coordinator.

County Solid Waste Management Board

A recognized leader within the DoD for solid waste recycling, Grissom ARB has shared the world-class expertise of its staff with the local community. Gary Belconis, Grissom Recycling Service Program Manager, is a key member of the local County Solid Waste Management Board, Community Advisory Committee, and facilitates local and county partnerships for recycling and reduction of solid waste. Grissom ARB has benefited through these partnerships by developing relationships with government officials, recycling businesses, and other solid waste generators tackling similar environmental issues. In addition, the sharing of expertise from the base to help overcome environmental challenges affecting both Grissom ARB and the community as a whole helps demonstrate that Grissom ARB is a good environmental neighbor.

Earth Day

To promote environmental awareness within both the Grissom Aeroplex and the local community, and to let people know that Grissom ARB is a good steward of the environment, the Environmental Flight organized a series of activities promoting Earth Day. First, the base held a "Run the Runway" event where participants were allowed to run down the 12,500 foot installation runway. Other activities organized by Grissom included essay and recycling contests, organ donation awareness, free blood pressure screenings, humane society information, 450 free trees for planting, and presentations on recycling.

Team Grissom

Throughout the visit to Grissom Air Reserve Base, PRO-ACT noticed that everyone associated with the Grissom ARB environmental program had a tremendous "team" attitude. The advances in the recycling program, the success of the HAZMAT pharmacy, the desire of individuals in Structural Maintenance to do things "the right way," were all done because everyone has pitched in and truly desired to achieve the best they can for the environment and the mission. The Environmental Flight has not been used as an enforcement team seeking to control organizations on base or search for potential violations. Rather, they have been working side-by-side with shop personnel, responding to questions and requests for help to develop the finest environmental program possible. The tremendous progress made in just the recycling program alone is a direct result of individuals working in the shops responding to questionnaires about the types of products they use and how it would be easiest for them to recycle those products. The Environmental Flight immediately took the initiative to respond to customer needs and lead implementation of needed recycling process changes. Team Grissom has excelled and has been noticed at the highest levels of the Air Force as well as in the State of Indiana for their excellence and commitment to the quality of environment and their efforts to pursue pollution prevention. The outstanding environmental programs led by Team Grissom serve as an example of commitment to excellence in environmental quality and serve as a model for others throughout the Air Force and the DoD.

The AFCEE Team - Recognized as a customer-oriented leader and the preferred provider of environmental, planning, design, and construction services.

***Pollution Prevention Success Stories* - TI 20993 - January 2000**

Need more information? Contact PRO-ACT at DSN 240-4214, (800) 233-4356, or pro-act@hqafcee.brooks.af.mil.

Printed on Recycled Paper